

Patent Claims

1. An apparatus for controlling a vehicle, in particular an aircraft, helicopter or else a simulator, having a handle (12) which is mounted such that it can move about two approximately mutually perpendicular axes (A, B), characterized

in that the axes (A, B) are located on different planes (E_1 and E_2 or E_1 and E_3) and are offset with respect to one another.

2. An apparatus for controlling a vehicle, in particular an aircraft, helicopter or else a simulator, having a handle (12) which is mounted such that it can move about two approximately mutually perpendicular axes (A, B) characterized in that a holding element (10) for holding a force sensor (11) is provided on an axis (A) with the force sensor being arranged centrally, or eccentrically, offset vertically upwards or downwards with respect to the axis (A).

3. The apparatus as claimed in claim 1 or 2, characterized in that a frame element (12) is provided, in which two drive elements (5.1, 5.2) act approximately at right angles to one another.

4. The apparatus as claimed in claim 3, characterized in that the frame element (1) is formed from a baseplate (2) with at least one holding plate (3.1, 3.2) which is connected to it at right angles.

5. The apparatus as claimed in claim 3 or 4, characterized in that the frame element (1) is formed in a U-shape from the baseplate (2) with holding plates (3.1, 3.2) which are in each case adjacent at the side and at right angles.

6. The apparatus as claimed in claim 5 or 6, characterized in that a first drive element (5.1) is connected to the one baseplate (2), with a second drive element (5.2) being fixed to the baseplate (2) outside it, and the holding element (10) for holding the force sensor (11) being arranged within the baseplate (2) such that it can pivot about the axis (A).

7. The apparatus as claimed in at least one of claims 4 to 6, characterized in that the second drive element (5.2) is connected to the baseplate (2) and is approximately at right angles to the first drive element (5.1).

8. The apparatus as claimed in at least one of claims 3 to 7, characterized in that the drive elements (5.1, 5.2) are connected to the frame element (1) at right angles to one another on the axes (A, B), with the axes (A and B) being offset with respect to one another by a distance (ΔX).

9. The apparatus as claimed in at least one of claims 3 to 8, characterized in that the drive elements (5.1, 5.2) are formed from an electronic control device (6), possibly with integrated force control and motor control, with an adjacent electric motor (7) and a downstream transmission (8).

10. The apparatus as claimed in at least one of claims 2 to 9, characterized in that the holding element (10) is connected to the first drive element (5.1) via an output flange (4), on which holding element (10) the force sensor (11) and, connected to it, the handle (12) are seated.

11. The apparatus as claimed in at least one of claims 2 to 10, characterized in that the holding element (10) is in the form of a plate or bracket which can pivot about the axis (A) and is fitted with the force sensor (11) and, connected to it, the handle (12).

12. The apparatus as claimed in at least one of claims 4 to 11, characterized in that a second holding plate (3.2) is connected to the baseplate (2) parallel to and at a distance from it, in particular at right angles to it, and is used to hold a balance weight (9), whose center of gravity lies on the axis (A).

13. The apparatus as claimed in at least one of claims 3 to 12, characterized in that the handle (12) can be actively pivoted, and in particular can be controlled, about the axes (A and B) by means of the drive elements (5.1, 5.2).

14. The apparatus as claimed in at least one of claims 3 to 13, characterized in that the drive elements (5.1, 5.2) and the force sensor (11) allow force feedback, ensuring active control of the handle (12).

15. The apparatus as claimed in at least one of claims 1 to 14, characterized in that the second drive element (5.2)

is firmly fixed on a structure or frame of a vehicle, of an aircraft or the like.

16. The apparatus as claimed in at least one of claims 8 to 15, characterized in that the axis (B) is offset by the distance (ΔX) above the axis (A).

17. The apparatus as claimed in at least one of claims 8 to 15, characterized in that the axis (B) is offset by a distance (ΔX) below the axis (A).

18. The apparatus as claimed in at least one of claims 1 to 17, characterized in that the axes (A and B) run at right angles to one another and are located on different planes (E_1 and E_2 or E_1 and E_3), which are parallel to one another.